Ohio Agricultural Experiment Station

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THE VALUE OF INDIVIDUAL RECORDS OF DAIRY COWS.

BY B. E. CARMICHAEL.

One of the most important of the numerous factors upon which success in dairying depends, is the ability of the dairy cow to yield dairy products economically. Investigations conducted by the University of Illinois Agricultural Experiment Station* showed that of 333 cows in 18 herds which were tested, 74 averaged only 126 pounds of butter fat per year, while only 30 produced 300 pounds or more of butter fat per year. If similar conditions exist in Ohio dairies, there are something like a quarter of a million cows in Ohio that fall far short of yielding a profit or even of paying for their food and care. The effect of such a condition upon the profits from dairying in this state is hard to estimate, but it is doubtless true that the presence of such cows in a herd is, in many instances, the cause of failure, or, at best, of only moderate success. Every dairyman has observed that some of the cows in his herd are better producers than are others, but it is not probable that anyone who has not kept accurate records for each of his cows realizes fully the bearing that these differences have upon the profits returned by his herd.

For a number of years records have been kept of the milk and butter fat produced by each cow in the Station dairy herd, and records of two cows for three years are presented herewith to illustrate the value of accurate knowledge concerning the performance of each cow kept in the herd.

*University of Illinois Agricultural Experiment Station Circular No. 103.

Both of these cows were of pure dairy blood, so their records are of pronounced value in showing that cows bred for the dairy may differ very widely in production. The cows whose records are given do not represent the extremes that may be found, for cows have produced more than twice as much butter fat in a year as did the better one of these two, and other cows have produced less than one half as much as the poorer one did. The difference which exists between the records presented approximates the difference which average dairymen who have carefully selected, but not tested dairy cows, might expect to find in their own herds, and are therefore of more value in this connection than the extreme cases would be.

TABLE I—SUMMARY OF THREE-YEAR RECORDS FOR TWO COWS.

	Date freshened	Lbs. milk	Average per cent of fat	Lbs. butter fat	Miscellaneous
COW NO 1.					
1st period	Dec. 19, 1902	6,022 0	5 78	348 07	First milking, Dec. 23, 1902
2nd period	Jan 9 1904	5,357 4	5 73	324 03	Live wt Dec 31, '02, 8541lbs
3rd period	Jan 31, 1905	5,585 4	5 70	318 50	Last milking, Dec 12 1905
Total		17,264 8	5 74	990 60	Live wt Dec15 '05 10251bs
Average per year		5,754 9	5 74	330 20	
COW NO. 2					
1st period	Dec 6, 1902	6,008 7	3 25	195 54	First milking, Dec 15 1902
2nd period	Nov 24 1903	9,666 1	3 05	294 56	Live wt Dec 31,'02, 10601bs
3rd period	Mar 17, 1905	6,420 5	3 18	204 30	Last milking, Nov 30, 1905
Total		22 095 3	3 14	694 40	Live wt Dec 1 '05 1318 1bs
Average per year		7,365 1	3 14	231 46	

At the beginning of the time covered by these records, cow No. 1 was nearly seven years old while No. 2 was a trifle over four years old. Cow No. 1 had freshened five times, while cow No. 2 had freshened twice. Although the conditions to which the two cows were subjected were not at all times absolutely the same, yet it cannot be said that either was given any advantage over the other so far as food or care is concerned, and it is safe and fair to attribute the difference in product and profit to the difference in the individuality of the two cows.

The average records of the two cows for three complete lactation periods, covering in the aggregate almost exactly the same length of time, are shown in Table II. There was a marked difference in favor of cow No. 1 as regards butter fat produced, and in value of products at prices as follows: butter fat, 25 cents per pound, skim

milk, 15 cents per hundredweight. Cost of food is given for three years from the date of freshening. It is seen that the profit over cost of food consumed is a trifle more than twice as much for cow No. 2 as for cow No. 1.

TABLE II—AVERAGE ANNUAL PRODUCTION OF TWO COWS FOR THREE YEARS

	Lbs of milk	Lbs of fat	Value of fat at 25c per lb	Value of skim milk at 15c per cwt.	Total value of product	Cost of food	Profit over food
No 1	5754 9	330 2	$82 55	$8 14	$90 69	$39 97	$50 72
No 2	7365 1	231 4	57 85	10 70	68 55	43 73	24 82

The figures in Table II do not present the net profit, however, for charges for the following should also be made against each cow: interest and taxes on investment, decline in value of cow (to provide for the purchase of a successor or to pay for raising one), interest and taxes on necessary buildings, and cost of caring for the cow. The cow should also be credited with the value of the manure which she has produced. No account is taken of calves produced. It is considered that each calf at birth will be of sufficient value to compensate for the cow's share of the maintenance of a sire.

The following rate of charges for the above items has been calculated and used by Mr. C. G. Williams of this Station, and is for average Ohio conditions in dairy sections:

Interest and taxes on value of cow	$ 3.50
Decline in value of cow	8.00
Interest and taxes on dairy buildings	3 50
Cost of care	12 00
	$27.00
Less value of manure	6.00
Total charges other than feed	$21.00

It is possible that the reason for making charges for decline in value of cow may not be perfectly clear without a word of explanation. It is considered that the average dairy cow would cost $60 at the beginning, would be useful in the dairy for six years, and would sell for $12 when discarded as a dry, thin cow. These figures, of course, do not apply to every case, but are for average conditions. If this decrease in value is not charged to the cow, the maintenance of the herd would require the investment of new capital for the purchase of cows, while by charging this item against each cow a fund is provided for the continuous maintenance of the herd.

The charges for decline in value of the cow might appear out of place if the maintenance of the herd is provided for by raising heifer calves, rather than by the purchase of cows as some would probably infer is indicated by the calculations here given. The real financial aspect of the question is little changed, if changed at all, by the method of maintaining the dairy herd, since the cost of keeping the calves until old enough for the dairy would be not far from the same as that of purchasing cows. This does not mean that the two systems of herd maintenance—buying cows and raising heifer calves—are equally good. On the contrary, it is believed that the best method of maintaining and improving the dairy herd is to ascertain by accurate test the real individuality of all cows in the herd; discard the ones that are surely unprofitable, and raise heifer calves from the very best of the profitable cows. There are conditions under which the growing of young stock is not practicable, and in those cases this part of the plan for the improvement of the herd would have to be dispensed with. In such cases, improvement would depend entirely upon the judicious retaining of good cows and rejecting of poor ones, on the basis of their actual records. In average dairy practice, however, the growing of heifer calves from the very best cows and sires strong in the blood of good producers is the most practical way of improving the herd.

TABLE III—AVERAGE ANNUAL PROFIT OVER FOOD AND NET PROFITS FOR THREE YEARS.

	Value of product	Cost of food	Profit over food	*Expenses other than food	Net profit
No. 1	$90 69	$39 97	$50 72	$21 00	$29 72
No. 2	68 55	43 73	21 82	21 00	3 82

*See page 3

Table III, showing the average *net* profit for the three lactation periods is of much more value than is Table II, which gives the value of product, less cost of food.

The figures in this table present the noteworthy fact that, while cow No. 1 yielded 32 percent more in total value of product and twice as much profit over feed as did cow No. 2, she yielded, after other charges as above specified were deducted, over *seven and seven tenths times as much net profit as did cow No. 2.* To show that the cow No. 2 was of pronounced dairy type and from all external appearances, seemed to be a very high class dairy cow, it may be said that she possessed to such an extent those external characteristics for which dairymen look that, when 8 years old, she

sold as a "springer" in the open market at Pittsburg for $70—not a record price, to be sure, but it would have been a good price for a really good cow and is undoubtedly much more than cow No. 1 would have brought, although she was actually worth much more than was No. 2.

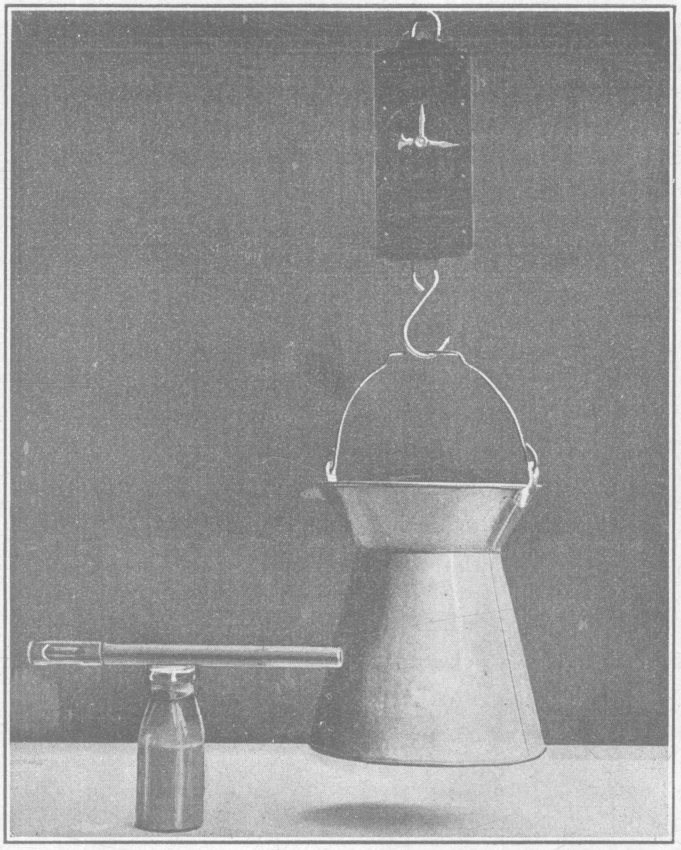


PLATE I—Milk scales, sampler and sample jar. One sample jar is required for each cow.

In order to secure a net annual profit of $1,000 from a dairy made up of cows like cow No. 1 it would be necessary to keep 34 cows. With the entire herd made up of cows like No. 2 a net annual profit of $1,000 would necessitate the keeping of 262 cows—quite a marked difference. The reader should bear in mind that these profits are *net*, after allowances have been made for cost of food at market prices, for interest and taxes on investment in herd and in dairy buildings, for maintenance of the size of the herd, and for paying for the labor expended in the dairy. In other words, the

dairy, as a special business, is charged for all expenses of interest, taxes, investment and labor and credited with all products, just as a manufacturer would charge his factory with all expenditures of money, raw material and labor, and credit it with the finished products turned out.

TABLE IV—FINANCIAL STATEMENT.

COW NO. 1—AVERAGE FOR THREE YEARS.

330.2 pounds of butter fat at 25c	$82.55
5424.7 pounds of skim milk at 15c per cwt	8.14
Value of product	90.69
Less cost of feed*	39.97
Profit over feed	50.72
Less other expenses	21.00
Net profit per year	$29.72

COW NO. 2—AVERAGE FOR THREE YEARS.

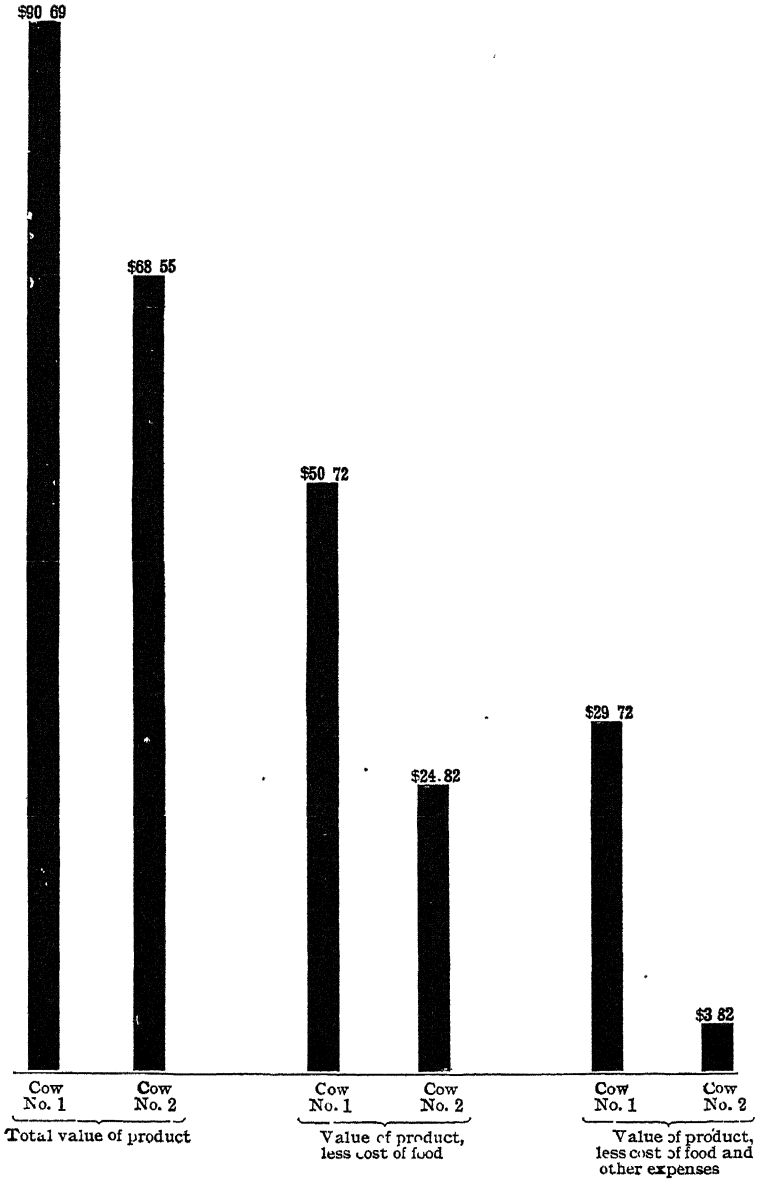
231.4 pounds of butter fat at 25c	$57.85
7133.7 pounds of skim milk at 15c per cwt	10.70
Value of product	68.55
Less cost of feed*	43.73
Profit over feed	24 82
Less other expenses	21.00
Net profit per year	$ 3.82

*Cost of feed calculated for three years from date of freshening.

But the mere statement of numbers of cows of the two kinds necessary to yield the above profit does not tell the whole story. Seven and seven tenths times as large a farm, barn and entire equipment would be required and practically seven and seven tenths times as much labor would need to be expended in caring for the herd.

The great difference between the capital required to conduct a dairy business yielding a net profit of $1,000 from cows like No. 1 and that required to conduct a dairy business large enough to produce $1,000 net profit from a herd like No. 2 is a mighty argument in favor of determining the real value of cows. Few dairymen could possibly clear $1,000 annually, above all expenses as previously indicated, from a herd of cows like No. 2, because of the fact that they could not, with the capital available for their use, conduct a dairy of 262 cows. The lack of capital would prevent such a business being carried on by average dairymen, and the low profits would as surely prevent a capitalist who could make the investment from doing so, providing he knew what the results would be. Both average dairymen and dairymen of large wealth, then, need accurate knowledge of the individuality of the cows in their dairies—a knowledge that may be readily obtained by the use of the milk scales and the Babcock test, with but little expenditure of time and money.

AVERAGE ANNUAL PRODUCT AND PROFITS FROM TWO COWS FOR THREE YEARS.



The record for a single year is not always a fair indication of the real capacity of a cow, since some unusually favorable or unfavorable factor may cause the yield to be higher or lower than normal. The record of a dairy herd should, then, be taken as a guide rather than as an absolute rule to be followed in selecting cows to be retained in the dairy or from which to raise heifers for the dairy, and in the use of this record, account should be taken of any disturbing factor which might influence the results. Without the record however, an estimate of the value of a dairy cow is surely in many, and probably in most cases little more than a guess.

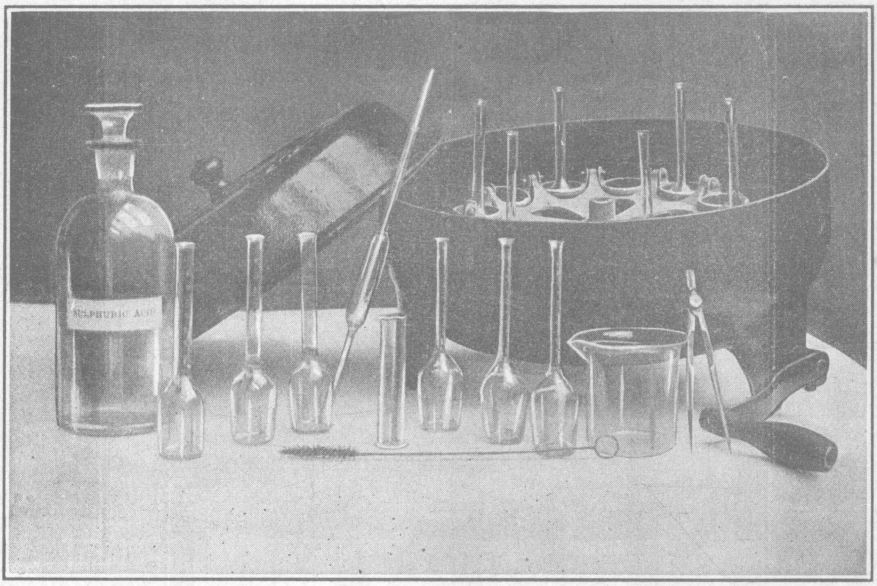


PLATE II—Babcock test outfit for determining butter fat content of milk.

No way is known whereby the real value of a cow may be determined without an actual test. The most convenient and satisfactory test now known is the use of scales and the Babcock test for determining the per cent of butter fat in the milk. The use of milk scales without a butter fat determination does not give the whole facts, neither does a butter fat determination without a consideration of the amount of milk throw much light upon the real worth of cows. Both *quantity* and *quality* of milk need to be considered, in short must be considered, if we are to learn the real facts in regard to our dairy cows.

Ohio Agricultural Experiment Station.

DAIRY HERD

Record of Individual Cows—Pounds of Milk per day.

March		Names or Numbers of Cows.										
1	A M											
	P M											
2	A M											
	P M											
3	A M											
	P M											
4	A M											
	P M											
5	A M											
	P M											
6	A M											
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7	A M											
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27	A M											
	P M											
28	A M											
	P M											
29	A M											
	P M											
30	A M											
	P M											
31	A M											
	P M											
TOTAL												

A convenient form of monthly milk sheet.

The Experiment Station is in position to furnish milk scales, Babcock test outfit and blanks for records to a limited number of dairymen who wish to keep accurate records of their cows and who will give the data thus obtained to the Station for the benefit of the dairy interests of the state. Any who wish to do such work with their own herds should write to the Ohio Agricultural Experiment Station, Wooster, Ohio, and the matter will be taken up with them.